



US009409228B2

(12) **United States Patent**  
**Renard et al.**

(10) **Patent No.:** **US 9,409,228 B2**  
(45) **Date of Patent:** **Aug. 9, 2016**

(54) **METHOD FOR ATTACHING THE COVER OF A CENTRIFUGAL COMPRESSOR OF A TURBINE ENGINE, COMPRESSOR COVER IMPLEMENTING SAME AND COMPRESSOR ASSEMBLY PROVIDED WITH SUCH A COVER**

(58) **Field of Classification Search**  
CPC ..... F01D 11/08; F01D 11/18; F01D 25/246  
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

(75) Inventors: **Beatrice Marie Renard**, Nay (FR);  
**Geoffroy Louis-Henri Marie Billotey**,  
Voiron (FR)

4,264,271 A 4/1981 Libertini  
2005/0118019 A1\* 6/2005 Roberts ..... F01D 9/045  
415/206

(73) Assignee: **TURBOMECA**, Bordes (FR)

(Continued)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 645 days.

FOREIGN PATENT DOCUMENTS

EP 1 903 185 3/2008  
EP 2 026 006 2/2009

(21) Appl. No.: **13/880,245**

OTHER PUBLICATIONS

(22) PCT Filed: **Oct. 20, 2011**

International Search Report Issued Feb. 13, 2012 in PCT/FR11/52448 Filed Oct. 20, 2011.

(86) PCT No.: **PCT/FR2011/052448**

§ 371 (c)(1),  
(2), (4) Date: **Apr. 18, 2013**

*Primary Examiner* — Nathaniel Wiehe  
*Assistant Examiner* — Brian O Peters

(87) PCT Pub. No.: **WO2012/052687**

(74) *Attorney, Agent, or Firm* — Oblon, McClelland, Maier & Neustadt, L.L.P.

PCT Pub. Date: **Apr. 26, 2012**

(65) **Prior Publication Data**

US 2013/0202428 A1 Aug. 8, 2013

(30) **Foreign Application Priority Data**

Oct. 21, 2010 (FR) ..... 10 58587

(51) **Int. Cl.**

**F01D 11/18** (2006.01)

**B21K 3/00** (2006.01)

**F01D 11/08** (2006.01)

**F01D 25/24** (2006.01)

**F02C 3/08** (2006.01)

(52) **U.S. Cl.**

CPC . **B21K 3/00** (2013.01); **F01D 11/08** (2013.01);  
**F01D 11/18** (2013.01); **F01D 25/246**  
(2013.01);

(Continued)

(57) **ABSTRACT**

An attachment arrangement at a middle of a cover having an elastically deformable portion. The cover includes a concave shell including an inner surface spaced apart from the compressor including an impeller including blades by an attachment. The attachment includes one connection end at the middle of the shell, another end attached to a casing of the turbine engine, and an axisymmetric diaphragm having a generally frusto-conical configuration having an arm profile coupled to the end for attachment to the casing by a double-elbow joint having right and obtuse angles when in a rest position. The distance between the inner surface of the shell and upper edges of the blades can be held constant during operation with minimum clearance adjustment. The cover can be moved such that clearance between the cover and blades of the compressor impeller remains substantially constant and as low as possible.

**8 Claims, 2 Drawing Sheets**

